CONTENTS

Preface vii

Conference information viii

Contents ix

In memory of professor E.P. Wohlfarth xiv

Chapter 1. 3d-transition metals and alloys: experiments

On the invar problem
A.Z. Menshikov 1

Neutron scattering from invar alloys
P.J. Brown, I.K. Jassim, K.-U. Neumann and K.R.A. Ziebeck 9

Magnetism at high-pressure in fcc Fe-based alloys
M.M. Abd-Elmeguid and H. Micklitz 17

Influence of thermomechanical treatment on the expansion behavior of invar and superinvar
G. Hausch, R. Bächer and J. Hartmann 22

Magnetic excitations and invar anomaly in γ-Fe–Ni–Pd alloys
A.K. Zatoplyaev, A.Z. Menshikov and S.M. Podgornych 25

The change of Fe–Ni-invar properties by alloying Mn and Cu
Ch. Böttger, H. Friedrichs, H. Neuhäuser and J. Hesse 29

Anomaly in the low temperature thermal expansion of alloys near the critical composition for magnetism
A.B. Kaiser and T.F. Smith 33

Temperature dependence of the Pauli susceptibility in liquid Ni–B–P alloys
I. Bakonyi and J. Kollár 36

μSR study of fcc $Fe_{100-x}Ni_x$ invar and non-invar alloys
S. Murayama, D. Ikeda, Y. Miyako, K. Nishiyama, K. Nagamine, T. Yamazaki, G. Dumpich and E.F. Wassermann 39

Anomalies in the specific heat of Fe–Ni based ternary invar alloys
G.V. Lecomte, N. Schubert and E.F. Wassermann 46

Magnetic irreversibilities in the quasi-binary Fe–Ni–Cr invar system
G.V. Lecomte, B. Rellinghaus and E.F. Wassermann 49

Magneto-elastic properties and invar anomaly of Fe–Pd alloys
M. Matsui and K. Adachi 53

Local stresses and elastic softening of Fe–Pd invar alloys
Y. Ohta 60

The magnetic states and magnetoelasticity in bcc invar-type
M. Acet, T. Schneider, H. Zähres, W. Stamm, E.F. Wassermann and W. Pepperhoff 63

The study of the thermal properties of γ-Mn from Mn–Cu alloys
M. Acet, H. Zähres, W. Stamm, E.F. Wassermann and W. Pepperhoff 67

Elastic constants and martensitic phase transitions in FePt and FeNiPt invar alloys
U. Kawald, W. Zemke, H. Bach, J. Pelzl and G.A. Saunders 72

High temperature elastic constants of fcc Fe–Ni invar alloys
Ph. Renaud and S.G. Steinemann 75

Thermal treatment and magnetic field dependences of the elasticity moduli of 12%Al–2%Co–Fe alloys
Z. Kaczkowski 79

Magnetic Grüneisen parameters of critical fluctuations in spin-density wave metals Cr, MnSi and Mn_3Si
E. Fawcett 83

Magnetoelasticity of Cr–Re alloys
H.L. Alberts 87

Low-temperature magnetic-elastic anomalies in fcc Fe–Cr–Ni alloys
H. Ledbetter 91

Chapter 2. 3d-transition metals and alloys: theory

Magnetic instabilities in invar
V.L. Moruzzi 99

Fixed-spin-moment method and canonical band theory
M. Podgórny 105

Electronic structure and ground state properties of Pt–Fe and Ni–Fe alloys
M. Podgórny 110

Invar properties in Fe–Ni system from band theory
E.G. Moroni and T. Jarlborg 115

Generalized magnetic susceptibilities of itinerant magnetic systems
F. Jordan and P. Entel 121

Numerical calculation of magnetovolume effect in ferromagnetic metals
I. Takahashi and M. Shimizu 125

Pressure effects on magnetocrystalline anisotropy in transition metals
F. Ono 129

Thermal expansion and magnetocrystalline anisotropy in hcp cobalt
F. Ono and H. Maeta 134

Antiferromagnetic and ferromagnetic gamma-manganese generalisation of the fixed-spin-moment method
H. Duschanek, P. Mohn and K. Schwarz 139

Magnetovolume effect and finite-temperature theory of magnetism in transition metals and alloys
Y. Kakehashi 143

Magneto-volume effects in Fe–Ni invar: a first principles theory
P. Mohn, K. Schwarz and D. Wagner 153

Analysis of a magnetic two-state model for invar systems
H.J. Gerber, K.D. Usadel and G. Brieskorn 157

A novel theoretical description of volume instabilities in itinerant magnetic systems
P. Entel and M. Schröter 160

The role of phonons in the volume behavior near the Curie point of ferromagnetic metals
D.J. Kim and H. Koyama 165

Photoemission calculations from ferromagnetic Ni(111) at elevated temperatures
H. Gollisch and R. Feder 169

Electronic structure of the Ni_3–Al alloy
P. Wosicki and A. Jezierski 172

Theoretical investigations of the magneto-optical Kerr effect by means of the spin-polarized relativistic linear muffin-tin orbital method
H. Ebert 175

Magnetoelasticity in itinerant electron metamagnetism
H. Yamada and M. Shimizu 179

Electronic structure of $Zn_{1-x}u_xCr_2Se_4$
S. Juszczyk 183

Magnetovolume effect of self-interstitial atoms in bcc iron
F. Ono, H. Maeta and J.P. Jakubovics 186

Theoretical study of the X-ray dichroism of 5d-impurity atoms dissolved in ferromagnetic Fe
H. Ebert and R. Zeller 191

Chapter 3. Intermetallics

Low temperature specific heat of nearly ferro- and antiferromagnetic compounds
H. Wada, M. Shiga and Y. Nakamura 197

Elastic properties and ^{57}Fe isomer shift of $Y(Fe, Al)_2$
M. Reissner, W. Steiner, J. Moser, G. Will and E. Gratz 203

Magnetoelasticity of $Nd_2Fe_{14}B$ and $Y_2Fe_{14}B$
M. Shiga, Y. Kusakabe, Y. Nakamura, K. Makita and M. Sagawa 206

Chapter 4. Amorphous

Neutron scattering studies of amorphous invar alloys
J.A. Fernandez-Baca 211

Magneto-volume- and hydrogenation effects in Fe-based amorphous alloys
S. Krompiewski, U. Krauss and U. Krey 219

Local magnetic properties of iron-rich amorphous $Fe_{100-x}Zr_x$ alloys
M. Ghafari, N. Chmielek, W. Keune and C.P. Foley 222

Local magnetic anisotropy and magnetostriction of amorphous ferromagnets
M. Fähnle, C. Elsässer, J. Furthmüller, R. Pawellek, E.H. Brandt and M.C. Böhm 225

Influence of the magnetoelastic coupling on the low field magnetic properties in amorphous Co–Fe–Si–B alloys
J. Świerczek, S. Szymura, J. Zbroszczyk and A. Siemko 232

Theory of forced linear magnetostriction in amorphous ferromagnets
R. Pawellek, M. Fähnle and H. Kronmüller 237

Magnetomechanical coupling of heat-treated Fe–Si–B metallic glasses
Z. Kaczkowski 241

Magnetostriction of $Sm_xFe_{80-x}B_{20}$ amorphous alloys
B. Idzikowski, A. Szlaferek and A. Wrzeciono 244

Temperature dependence on the magnetostriction and stress induced magnetic anisotropy in $Co_{45}Ni_{30}Si_{15}B_{10}$ amorphous alloys
J. González and J.M. Blanco 247

Chapter 5. Thin films

Magneto-optical studies of metastable 3d-transition metal films
C. Liu and S.D. Bader 253

Magnetoelasticity in rare-earth superlattices and films
R. Erwin, J. Rhyne, J. Borchers, R. Du, M. Salamon and C.P. Flynn 260

Magneto-volume effects in γ-Fe ultrathin films and small particles
W. Keune, T. Ezawa, W.A.A. Macedo, U. Glos, K.P. Schletz and U. Kirschbaum 269

Electronic and structural properties of thin films of Fe on Cu(111) and of the system Cu/Fe/Cu(111)
F. Pontkees and H. Neddermeyer 276

Magneto-volume effects of γ-Fe precipitates in Cu and CuAl matrices
T. Ezawa, W.A.A. Macedo, U. Glos, W. Keune, K.P. Schletz and U. Kirschbaum 281

Spin wave resonance in thin films and in bulk samples of FeNi invar alloys
R. Kordecki, T. Kochmann, H. Volz, J. Pelzl, E. Becker, G. Dumpich and Z. Frait 285

Thermal diffusion of iron into a copper(100) crystal studied by Auger electron spectroscopy (AES)
M. Arnott and W. Allison 289

Magnetic and structural behavior of $Fe–Fe_xNi_{1-x}$ multilayers
E. Becker, G. Dumpich, U. Kirschbaum and E.F. Wassermann 294

Chapter 6. Heavy-fermion systems

μSR on actinide and related compounds
L. Asch 299

Magnetovolume effects and magnetic Grüneisen parameters in transition-metal and heavy-fermion systems
A.B. Kaiser 311

Perspective on heavy-electron and Kondo-lattice systems from high pressure studies
J.D. Thompson, Z. Fisk and G.G. Lonzarich 317

Magneto-volume effects in some selected heavy-fermion compounds
A. de Visser, J.J.M. Franse and J. Flouquet 324

Electron–phonon interaction in heavy fermion compounds. Electromagnetic generation of ultrasonic waves
G. Hampel, G. Bruls, D. Weber, I. Kouroudis and B. Lüthi 333

Specific heat and thermal expansion in $U(Pt, Pd)_3$
P.E. Brommer, M. van Sprang and J.J.M. Franse 337

Study of the metal–insulator transition in Ti_4O_7 by optical investigations
L. Degiorgi, P. Wachter and C. Schlenker 341

List of contributors 347

Analytic subject index 348